

SECTION 15830 - CEILING FANS

PART 1 - GENERAL

1.01 GENERAL CONDITIONS

As specified in Section 00700.

1.02 GENERAL REQUIREMENTS

Furnish and install ceiling fans as shown on the drawings and perform all operations to complete the installation ready for use.

1.03 QUALITY ASSURANCE

- A. Fans shall be provided with metal identification plates **or adhesive labels** permanently affixed in a conspicuous location identifying the manufacturer, model and **model** number.
- B. Fans shall be U.L. listed. **The U.L. label shall be firmly affixed to the fan.**
- C. **Fans shall either be assembled and/or manufactured or distributed in the U.S.A. Imported fans and parts are acceptable provided they comply with the requirements of this specification and are distributed through an American based distributing/manufacturing company who shall be responsible for the execution of the fan's guaranty/warrant agreement.**
- D. **The manufacturer or the American based distributing/manufacturing company shall be an established company who has regularly engaged in the manufacture and/or distribution of ceiling fans for the past 10 years.**
- E. **The fan distributor/manufacturer shall maintain an Authorized Service Center in the State of Hawaii. In addition, the service center shall maintain a local inventory of replacement and service parts.**

1.04 SUBMITTALS

Submit six (6) copies of the following to the Engineer:

- A. Shop drawings and/or manufacturer's product data showing construction and installation details.
- B. Manufacturer's installation instructions.
- C. Manufacturer's electrical control diagrams.
- D. Manufacturer's operations and maintenance manual.
- E. Manufacturer's standard color chart for body and blades.
- F. Manufacturer's guaranty/warranty.

G. Maintenance Service Contract.

1.05 GUARANTY AND WARRANTY

The Contractor shall furnish the following:

- A. A written guaranty against all defects in materials, workmanship and installation. He shall certify that he will correct any defects other than ordinary wear or improper use that may develop within one year from the date of project acceptance at no cost to the State.
- B. Manufacturer's **standard 15 year warranty on the fan motor.**
- C. **Manufacturer's standard 5 year warranty on the flywheel.**

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Asbestos Prohibition: No asbestos containing materials or equipment shall be used under this section. The Contractor shall ensure that all materials and equipment incorporated in the project are asbestos-free.

B. Ceiling fan shall be constructed with the following requirements and accessories:

1. General:

- a. Minimum 4-blade type with minimum 52" sweep which will provide quiet operation.
- b. All-metal construction.
- c. **The fan body** and switch cup/cap shall be die-cast or stamped heavy gage steel. **The switch cup/cap shall be removable for ease of service.**
- d. **The support assembly (two-piece canopy with cross bar mounting bracket or single piece canopy with mounting bracket) with a ball and socket hanging system (Cathedral Hanging) shall be U.L. listed. The locking system shall be by cross pin and set screw. Where a two-piece canopy is used, the cross bar mounting bracket shall be made of either die-cast or stamped heavy gauge galvanized steel or stainless steel. Aluminum or zinc is not acceptable. Where a mounting bracket is used as the support assembly beneath a single piece canopy, it shall be made of high quality non-recycled die cast zinc.**

Fasteners used to secure the support assembly to the substrate shall be electroplated steel or stainless steel.

- e. **Non-rotating stationary hanger pipe of cold rolled steel with powder coated finish, specifically designed and manufactured to support the fan, nominal 1/2" (minimum 5/8") inside diameter, fastened directly to the motor housing. Thin walled Electrical Metal Tubing (EMT) and aluminum tubing is not acceptable.**
- f. **Fan control wiring shall be located within the hanger pipe, protected from rotating parts.**

For unusually wet environments, specify the provision of galvanized steel or stainless steel hanger pipes.

- g. Extension lead wires shall be of sufficient length to accommodate the required length of extension poles. Rewiring of the fan unit or splicing of the wires to increase its length is not acceptable.

2. Motor:

- a. The motor shall be manufactured in accordance with NEMA, U.L. or CSA Standards.
- b. The motor shall be either an "Induction Type" or "Spinner Type" as described below:
 - (1) Induction Type (K55 or approved equal):
 - (a) Stator width = min. 140 mm.
 - (b) Stator ht. = min. 25.0 mm.
 - (c) No. of winding poles = Min. 18.
 - (d) Min. 2,244 lineal feet of copper wire winding.
 - (2) Spinner Type:
 - (a) Stator width = min. 188 mm.
 - (b) Stator ht. = min. 20 mm.
 - (c) No. of winding poles = Min. 16.
 - (d) Casing = Aluminum, minimum 5/16" thick.
- c. The motor shall be direct drive, 120 VAC, 60 Hz, rated minimum **0.7** Amps, reversible, with 100% copper windings.
- d. Electrical windings shall be insulated in accordance with U.L. Class "B" Standards. Paper insulation is not acceptable.
- e. The motor's operation shall not interfere with radio or television reception.

3. Bearings:

- a. Bearing shall be corrosion resistant, permanently lubricated, sealed, no-oil

type requiring no maintenance.

- b. Where spinner type motors are used, the bearings provided shall be high quality double shielded bearings of the type described above.

Delete the type of control switching which does not apply to your project.

4. Control Switch:

a. Triple capacitor speed control.

- b. Single switch controlling a single fan unit:

- (1) Solid-state speed control, step speed selection, reversible to pull the air up or push it down.
- (2) Switch shall have a knob for "off", "low", "medium" and "high" speed control.
- (3) Speed range shall be approximately 20 RPM to 210 RPM.
- (4) Switch shall be mounted in a metal box on the wall.

- c. Single switch controlling a bank of fan units:

- (1) "On-off" control switch controlling the number of fans as indicated on the drawings. Switches shall be mounted in a common metal box on the wall.
- (2) The control switch shall have sufficient amperage to supply power to the number of fans connected to the switch as indicated on the drawings.
- (3) The fan speed control pull chain shall be equipped with break-away linkage.

5. Fan Blades and Fan Blade Holders:

- a. Fan blades shall be manufactureed from seasoned hardwood, minimum 6-ply cross-laminated construction with sealed edges.

- b. Blade holders shall be U.L. listed, rigid, manufactured from die-cast steel or non-recycled zinc alloy. Stamped steel is not acceptable.

The angle or "Pitch" of the holder shall be factory calibrated to be no more than 16 degrees and no less than 12 degrees.

- c. Each set of fan blades and holders (for each individual fan) shall be balanced to within one gram of each other.

- d. Where stator motors are used, noise-reducing components such as isolation rings and rubber cushions shall be provided.

Specify fan blade color.

- e. Blade finish shall be _____.

6. Flywheels: Where provided, flywheels shall be manufactured of butyl, neoprene or EPDM (ethylene propylene diene monomer) modified rubber and shall be warranted for a minimum of 5 years against deterioration and sagging. Plastic flywheels are not acceptable.

7. Finish: Electroplated, epoxy or baked-on paint coating finishes shall provide a uniform smooth finish that is tarnish, rust and scratch resistant.

Specify fan finish color.

The fan body and pipe extension finish shall be _____.

- a. **Brass finishes shall be electroplated and finished with a clear acrylic or epoxy.**
- b. **Painted color finishes shall be an electrostatically applied, baked-on powder coat system.**

PART 3 - EXECUTION

3.01 INSPECTION

The Contractor and the Installer shall examine the areas and conditions under which the ceiling fans are to be installed.

Should any condition be found unsuitable, no work shall be done until the unsatisfactory conditions have been corrected and are acceptable to the Installer. Proceeding with work will imply acceptance of the conditions by the Installer.

Show mounting detail on plans.

3.02 INSTALLATION

- A. Verify the existing **roof/ceiling** deck slope and mounting conditions. Install mounting plates as required to provide a solid, level and plumb surface for mounting of the outlet box. Mounting plates and outlet box shall be securely mounted and capable of supporting a minimum of 40 lbs. Only UL listed outlet boxes labeled "For Fan Support" shall be used.
- B. Fan motor shall be properly grounded.
- C. Assemble and install the fans in accordance with the manufacturer's instructions and recommendations, complete and ready to use.
- D. Fans shall be installed at a height as noted on the plans, but in no case shall a fan be mounted with the bottom of its blades lower than 7'-6" above the finished floor surface. In addition, fans shall be installed so that fan blades are no closer than 18 inches away from adjacent walls and finishes.

Indicate fan location and mounting height on plans. Coordinate location of fans with room lighting so as to no induce strobing effect.

- E. Fan blades shall be uniformly balanced and tightly fastened to the blade holders. Blade holders shall be tightly fastened to the flywheel or motor casing.
- F. Fans shall be well balanced and shall not wobble or shake when running at all speeds. A maximum of 1/8" **horizontal** movement **(at the end of the fan blades)** is acceptable.

3.03 INSTRUCTION TO PERSONNEL

Instruct the operations personnel in the aspects of safety, operation and maintenance of the fans.

3.04 FIELD QUALITY CONTROL

Operational Test: Perform an operational test as required by the manufacturer in the presence of the Engineer. **Each fan unit shall be operated at low, medium and high speeds.**

3.05 CLEANING

Prior to acceptance of the work, thoroughly clean the fan unit and the surrounding area. Patch and/or paint any surface marred or damaged as a result of the fan installation as required to restore the surface to its original condition.

3.06 TWO-YEAR MAINTENANCE SERVICE CONTRACT

- A. In addition to the Guaranty on materials and workmanship noted under Sub-Section 1.05, the Installer shall provide a Maintenance Service Contract, countersigned by the General Contractor.
- B. The maintenance service shall provide for all labor, material, equipment and parts to service the ceiling fan complete, on a periodic basis, so as to assure its proper operation and

function. Such service shall include cleaning of the fan and blades, re-balancing of the blades where necessary to eliminate wobbling or shaking, etc.

- C. The Maintenance Service Contract shall extend for a period of two (2) years commencing on the Project Acceptance Date. All costs for periodic maintenance services shall be included in the lump sum base bid price.
- D. Following each service/inspection, furnish an inspection report to the user agency.
- E. All maintenance work shall be performed between the hours of 7:30 a.m. to 4:00 p.m., on normal working days from Monday through Friday, excluding State holidays. The contractor shall schedule their visit and work with the user agency.
- F. The maintenance contractor shall exercise caution during the progress of his maintenance and repair work to prevent damage to the ceilings and other building elements. The contractor shall restore existing construction, damaged by his negligence, to its original condition at his own expense.
- G. The Maintenance Contractor shall keep a separate log recording all maintenance calls to the project at his office. The log shall include, as a minimum, the following information:
 - 1. Name of the person making the service call.
 - 2. Date of the service call.
 - 3. Time in and out from the project.
 - 4. Findings and work performed.
- H. The Maintenance Service Contract does not include repairs resulting from vandalism, negligent use or misuse of the equipment.
- I. Periodic maintenance shall be performed on a quarterly basis.

END OF SECTION

NOTES TO ARCHITECT